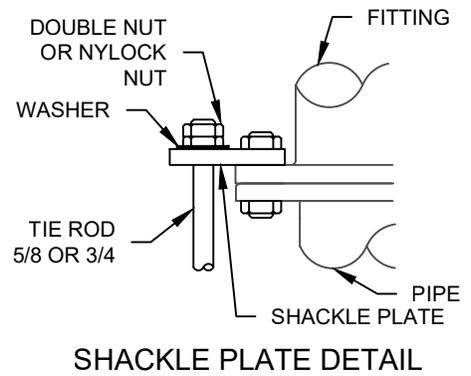
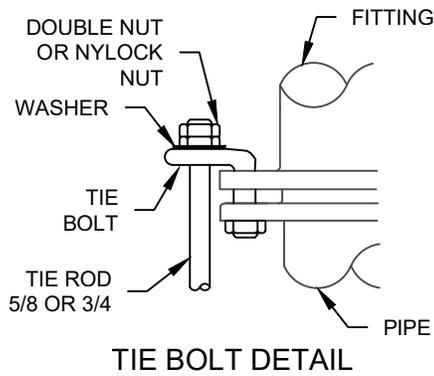
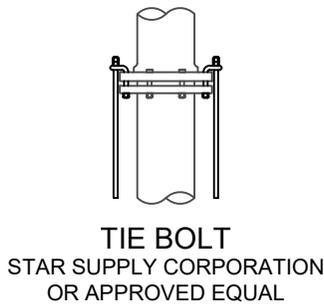


ASTM A242 (COR-TEN® OR EQUAL) STEEL ROD DIAMETER: 5/8" OR (3/4")								
PIPE DIAMETER	NUMBER OF TIE RODS PER JOINT				MAXIMUM TIE ROD LENGTH, FEET			
	TEE DEAD END VALVE 90° BEND	45° BEND	22.5° BEND	11.25° BEND	TEE DEAD END VALVE 90° BEND	45° BEND	22.5° BEND	11.25° BEND
3	2 -	2 -	2 -	2 -	100 -	100 -	100 -	100 -
4	2 (2)	2 (2)	2 (2)	2 (2)	100 (100)	100 (100)	100 (100)	100 (100)
6	2 (2)	2 (2)	2 (2)	2 (2)	60 (90)	80 (100)	100 (100)	100 (100)
304SS OR OTHER STEELS ROD DIAMETER: 5/8" OR (3/4")								
3	2 -	2 -	2 -	2 -	100 -	100 -	100 -	100 -
4	2 (2)	2 (2)	2 (2)	2 (2)	100 (100)	100 (100)	100 (100)	100 (100)
6	2 (2)	2 (2)	2 (2)	2 (2)	60 (90)	80 (100)	100 (100)	100 (100)



**NOTES:**

1. SIZING GREATER THAN 6" SHALL BE BY ENGINEER OF RECORD.
2. TIE RODS SHALL BE "ALL THREAD" ROD OF ONE OF THE APPROVED MATERIALS:
  - 2.1. ASTM A242 (COR-TEN)
  - 2.2. 304 STAINLESS STEEL
  - 2.3. ASTM F3125 A325 TYPE 3
  - 2.4. ASTM A588
  - 2.5. ASTM A709 GR 50W
 MILD STEEL WILL NOT BE ALLOWED. ASTM A307 GRADE A OR B ROD IS ALLOWED, BUT MUST BE FIELD COATED AFTER ASSEMBLY WITH EPOXY, COAL-TAR OR RUBBER.
3. TIE RODS SHALL HAVE "NATIONAL-COARSE" THREAD WITH EITHER TWO NUTS OR ONE SELF-LOCKING NUT AT EACH END. NUTS ARE TO BE STAR NATIONAL TIENUT OR NUT OF EQUIVALENT OR GREATER OUTER DIAMETER.
4. NUMBER OF TIE RODS PER JOINT SHALL BE IN ACCORDANCE WITH TIE ROD SELECTION TABLES ABOVE UNLESS OTHERWISE SHOWN ON APPROVED DESIGN PLANS.
5. TIE RODS SHALL BE ASSEMBLED SYMMETRICALLY ABOUT EACH JOINT (IF AN EVEN NUMBER OF RODS ARE USED THEN EACH ROD SHALL HAVE A ROD LOCATED ON THE DIRECT OPPOSITE SIDE OF JOINT. IF 3 OR 6 RODS ARE USED THEN AN EQUAL NUMBER OF UNSHACKLED BOLT HOLES SHALL BE LEFT BETWEEN ANY TWO TIE RODS.)
6. TIE ROD NUTS SHALL BE TIGHTENED UNIFORMLY AT EACH JOINT.
7. TIE ROD LENGTHS SHALL NOT EXCEED THOSE LISTED IN ABOVE TABLES, UNLESS SPECIFICALLY SHOWN ON APPROVED PLANS.
8. TIE ROD COUPLINGS SHALL BE GALVANIZED "STAR NATIONAL PRODUCTS TIECOUPLING" OR APPROVED EQUAL.
9. TIE RODS SHALL BE ATTACHED TO JOINTS WITH TIE BOLTS, EXCEPT FOR FIRE HYDRANT INSTALLATIONS WHICH SHALL USE TIE BOLTS ON LUGS. TIE BOLTS SHALL BE GALVANIZED "STAR NATIONAL PRODUCTS TIEBOLT" OR APPROVED EQUAL. "DUC-LUGS" ARE NOT ALLOWED.



**TIE RODS**

U-WAT-5-Tie-Rods.dwg

DRAWING NUMBER	U-WAT-5
SCALE	NONE
REVISION DATE	10/21
DEPARTMENT	PW